~~pulling the ingot from the melt at a target pull rate, said target pull rate substantially following a velocity profile, said velocity profile stored in memory and defining the target pull rate;~~

generating a signal representative of an error between a target diameter of the ingot and a measured diameter of the ingot during growth;

~~performing proportional-integral-derivative (PID) control on the error signal and generating a temperature set point as a function thereof, said temperature set point representing a target temperature of the melt;~~

determining a power set point for the power supplied to the heater from the temperature model as a function of the ~~temperature set point generated by the PID control~~ error signal and independent of a measured temperature; ~~and~~

adjusting the power supplied to the heater according to the power set point thereby changing the temperature of the melt to control the diameter of the ingot; and

pulling the ingot from the melt at a pull rate following a target pull rate defined by a velocity profile, said velocity profile being stored in memory and defining the target pull rate independent of the error signal.

Claim 2 (original): The method of claim 1 wherein the step of adjusting the power includes applying a pulse of power to the heater, said power pulse having an amplitude greater than a steady state value corresponding directly to the temperature set point.

Claim 3 (original): The method of claim 2 wherein the step of determining the power set point includes calculating power output by the following:

$$P_1 = P_0 + G * \left[k * \sum_{n=0}^{i} T_n - (k-1) * \sum_{n=0}^{i} T_{n-m} \right]$$

where P_1 is current power, P_0 is initial power, G is a conversion from temperature units to kW, k is the amplitude of the power pulse, T_n is the temperature set point at time t = n, T_{n-m} is the temperature set point at time t = n-m and m represents the duration of the power pulse.

Claim 4 (original): The method of claim 1 wherein the step of determining the power set point from the temperature model includes defining an input to the temperature model, said input to the temperature model including a pulse portion followed by a steady state portion.

Claim 5 (original): The method of claim 4 wherein the pulse portion of the input to the temperature model has an amplitude greater than a steady state value corresponding directly to the temperature set point.

Claim 6 (original): The method of claim 4 wherein the pulse portion of the input to the temperature model has a duration defined by:

$$t = -\tau * \ln(1 - 1/k)$$

where τ is a time constant of an exponential function defining the temperature model and k represents the amplitude of the pulse portion of the input to the temperature model.

Claim 7 (original): The method of claim 1 wherein the step of defining the temperature model includes defining a delay period, gain and first-order lag function response.

Claim 8 (original): The method of claim 7 wherein the step of defining the temperature model includes defining the first-order lag function response by an exponential function of time as follows:

$$f(t) = k * (1 - \exp(-(t - t_d)/\tau))$$

where t_d is the delay period occurring prior to the first-order lag function response, τ is a time constant of the function and k represents the amplitude of a power input to the temperature model.

Claim 9 (previously amended): The method of claim 1 further comprising the step of varying the rate at which the ingot is pulled from the melt to control diameter of the ingot, said step of varying the pull rate occurring during growth of a first portion of the ingot and said step of pulling the ingot at the target pull rate substantially following the [predetermined] velocity profile occurring during growth of a second portion of the ingot.

Claim 10 (original): The method of claim 1 wherein the step of defining the temperature model includes measuring changes in the temperature of the melt in response to changes in the power supplied to the heater.

Claims 11-18 (cancelled):

Claim 19 (new): The method of claim 1 further including performing proportional-integral-derivative (PID) control on the error signal and generating a temperature set point as a function thereof, and wherein the power set point for the power supplied to the heater is determined from the temperature model as a function of the temperature set point generated by the PID control.